

# Sloan Digital Sky Survey (SDSS) Telescope

at Apache Point, New Mexico

The Telescope uses a similar design to what is seen in Figure 1 (called a Cassegrain telescope).

The main mirror reflects the light from the viewing area into a second mirror, which then focuses the image at the eye-piece.

In this case, sensors or other scientific equipment are placed at the 'focal point'.

This design forms the image at the at the end of the telescope but means the middle of the image has a hole, because the second mirror covers the main one.

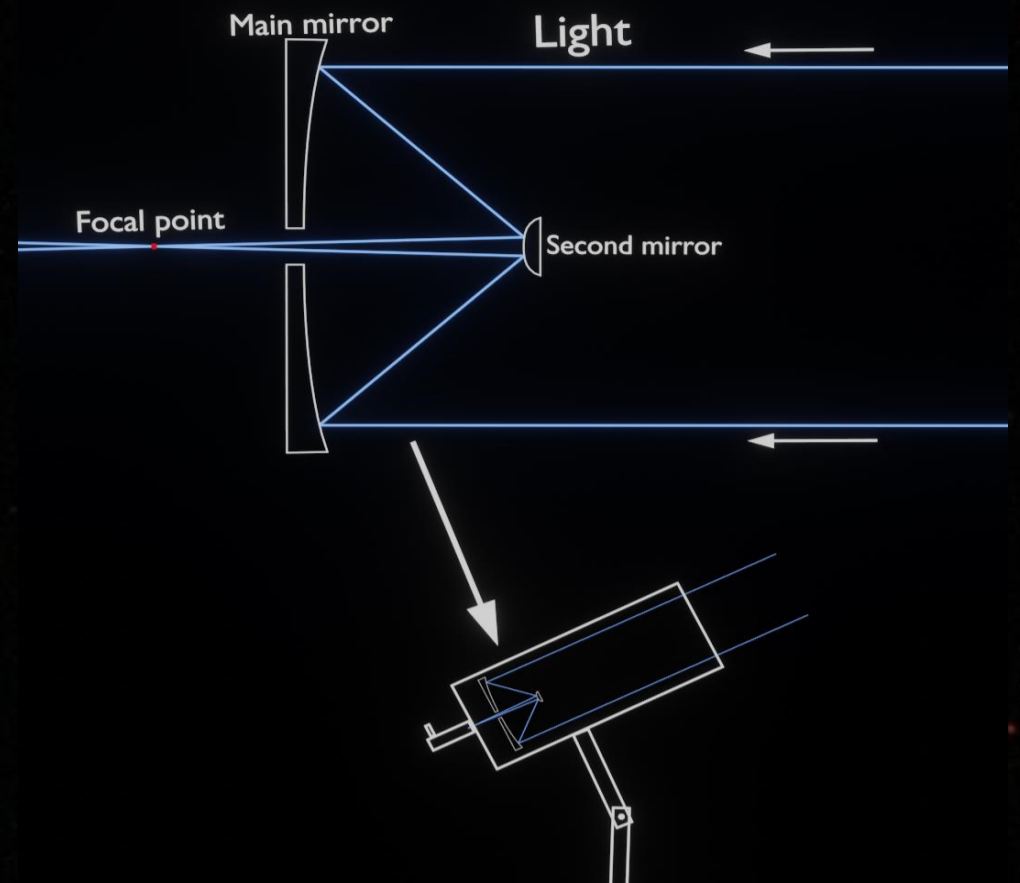


Figure 1 – A simplified view of the Cassegrain telescope design.

The telescope can be setup in two ways - to capture images using a large setup of digital image sensors (CCDs) or be used to analyse the light from distant objects using a technique called Spectroscopy.

When capturing images of the night sky, only some of the light is allowed to reach the sensors, this is to allow for higher detail to be seen and stop other light sources from interfering. To do this, filters that allow only some wavelengths through are used.

- **Ultraviolet (U)** captures light with a wavelength of **354nm**; with energy above the range of human vision but allows structures and events usually outside of our view to be captured.
- **Green (G)** captures light with a wavelength of **475nm**; at the top end of the range of our vision.
- **Red (R)** captures light with a wavelength of **622nm**; at the lower end of our vision range.
- **Infrared (I)** captures light with a wavelength of **763nm**; with energy below the range of human vision, but similarly to Ultraviolet, allows significant events to be observed for study.
- **Lower Infrared (Z)** captures light with a wavelength of **905nm**; lower portion of infra-red. It is used for similar reasons as **Infrared** and **Ultraviolet**.

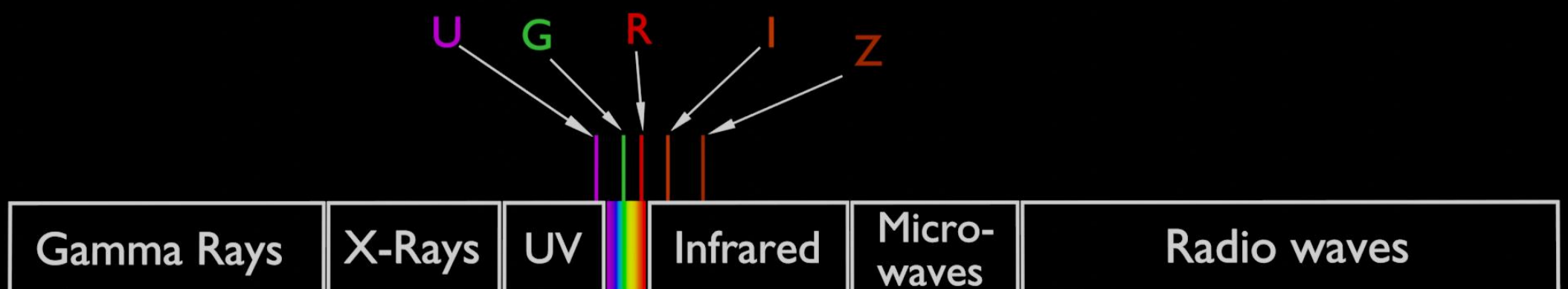


Figure 2 – The Electromagnetic spectrum and the filter positions within it.